Certification and Qualification Information for Manufacturers

MIL-PRF-19500

ISSUED BY:
DEFENSE SUPPLY CENTER COLUMBUS
SOURCING AND QUALIFICATIONS UNIT
ELECTRONIC DEVICES TEAM - DSCC-VQE
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1.0 INTRODUCTION

1.1 Preface

This document is applicable to the MIL-PRF-19500 program administered by the Defense Supply Center Columbus (DSCC) in its capacity as the qualifying activity. This document has been developed to help the manufacturer obtain and maintain certification and qualification to MIL-PRF-19500. In addition, this document specifies the requirements that were removed from MIL-S-19500 as part of the process of reclassifying it as a performance specification. It is not the intent of this document to add any new requirements. The rules for use of commercial laboratories and the requirements for commercial laboratories to obtain and maintain laboratory suitability can be found in the *Laboratory Suitability Information* booklet published by DSCC-VQ.

The manufacturer, by application for certification and subsequent listing on the Qualified Manufacturers List, QML-19500, agrees to comply with all provisions specified in MIL-PRF-19500 and herein.

L. DARRELL HILL

Chief

Sourcing and Qualifications Unit

1.2 Contact Points

Beneficial comments or recommendations, which may be of use in improving this document, should be addressed to:

U.S. Mail	Private Carriers (e.g. UPS, Fed Ex, etc.)
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Defense Supply Center Columbus	Defense Supply Center Columbus
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P.O. Box 3990	3990 East Broad Street
Columbus, OH 43216-5000	Columbus, OH 43213

Requests for an audit, copies of the forms referenced in this document, questions, or requests for further information about the MIL-PRF-19500 program should be directed to one of the VQE contacts listed below.

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You may obtain a copy of any of DSCC-VQ's documents by visiting the "Downloads" section of our World Wide Web site at:

http://www.dscc.dla.mil/offices/sourcing_and_qualification/

2.0 FACILITY CERTIFICATION

2.1 Initial Facility Certification

2.1.1 Manufacturer Request

The manufacturer (Basic Plant) shall contact VQE by letter requesting that their facility or facilities be certified. This letter shall include; the location of the facility or facilities, a listing of the product to be qualified (to be segregated by product lines), and a schedule/timeline showing when the basic plant anticipates being ready for a facility audit. The certification requirements of MIL-PRF-19500 apply to both the wafer fabrication and the assembly facilities. All required testing shall be performed at a facility or facilities with MIL-STD-750 laboratory suitability for the required test methods.

2.1.2 DSCC-VQE Contact

The assigned VQE point of contact will respond by letter informing the basic plant of the necessary steps to be followed and of the pre-audit information to be submitted. Once the pre-audit documents are received and reviewed for acceptability, the facility will be scheduled for an audit.

2.1.3 Pre-Audit Information

The pre-audit information for initial audits and in some cases for re-audits will consist of the following as a minimum:

a. Quality manual (controlled copy)

b. Identification of the management representative

c. Process flows for each product line to be qualified

d. Process monitor procedures

e. Document control procedure

f. Internal audit procedure

g. Internal audit results (including deficiencies found and corrective actions taken) for the immediate 12 months prior to submission to VQE.

h. Conformance inspection procedure, which will include: inspection lot formation and log, date code selection, sampling procedure (including resubmission, lot acceptance, and corrective actions for conformance inspection lot failure.

i. Electrostatic discharge handling procedure

j. DSCC Form 36's (Test Equipment List) or equivalent for all MIL-STD-750 test methods that will be required to qualify the product covered by the process flows.

k. DSCC Form 36D's (Design and Construction Information) or equivalent for product to be qualified.

l. If a Basic Plant elects to use an equivalent Quality System, it is the Basic Plant's responsibility to demonstrate in writing to VQE how their system is equivalent to the requirements of MIL-PRF-19500, Appendix C and/or D. A cross reference

that relates the Appendix C and/or D requirements to the Basic Plant's system is required.

Additional items may be required depending on the type of facility, level of qualification (quality level), etc. For re-audits, the pre-audit information requirements will be as requested by VQE.

2.1.4 Proposed Basic Plant / Contracted Plant Operations

If a basic plant is planning to utilize a contracted plant for either wafer fabrication or assembly there must be a written agreement between the basic plant and the contracted plant. A representative of the basic plant is required to participate in the certification audit of the contracted plant unless otherwise approved by the qualifying activity. The written agreement will, at the minimum, address the following issues:

a. Names and addresses of the Basic plant and Contracted plant. Sufficient detail is required to ensure that all facilities affected are included. Any subsequent audit or QML listing will be based on this information.

b. Effective date of the agreement.

c. Purpose. This section must include what device types, quality levels, associated specifications (slash sheets), technologies, and packages are to be included within the context of the agreement. Also, specific operations performed by the Contracted plant shall be defined.

d. Duration/Period of the agreement. A minimum duration of two years is required initially. Renewals shall be for a minimum of one-year durations.

e. Renewal. The methods of either automatic or negotiated renewal of the agreement must be outlined in sufficient detail to provide an adequate understanding.

f. Quality System requirements. The quality system requirements of MIL-PRF-19500 shall be applied to both the Contracted plant and the Basic plant. Any additional quality system requirements between the plants shall be outlined as well. A reporting and feedback loop for nonconformances must be established.

g. Design Change control. The Contracted plant must define how and when design changes (process, material, equipment) are to be communicated to the Basic plant. Provisions for limited continuation of the current design must be included in order to maintain a continuous source of supply of product until the new design can be qualified.

h. Termination. The terms by which either party can terminate the agreement must be documented. This must include termination for cause, termination for convenience, etc. An end of life period of a minimum of six months must be allowed for the basic plant in the case of termination for convenience.

i. Supplied Documentation. The agreement shall identify what documentation shall be exchanged between plants. Both baseline documentation (design, process, and system) and deliverables (lot by lot information) must be defined. The contracted plant will supply controlled copies of flowcharts and baselines to the basic plant and completed copies of lot travelers will accompany each shipment.

j. Supplied Resources. Resources (equipment, personnel, materials, etc.) provided by the Basic plant to the Contracted plant shall be identified. Control of these resources shall be defined in the Contracted Plant's quality system.

k. Audit. The agreement must allow the Qualifying Activity and the Basic plant to audit the facilities of the Contracted plant. There shall be no restrictions on the audit rights of the Qualifying Activity. The scope of the Basic plant's audit rights is discretionary and shall be defined if not unlimited.

l. Applicable Law. Applicable laws of the United States of America must be made part of the agreement. In addition, specific State or Commonwealth laws and regulations shall be included when applicable.

m. Signatures. Authorized representatives of both facilities must sign the agreement.

With the approval of the qualifying activity, individual operations within either the assembly (e.g. plating) or wafer fabrication (see 19500 paragraph D.3.1.3.1.4) process may be subcontracted without an agreement as specified above, however, self audit requirements still apply.

2.1.5 Foreign Plant Certifications

If the basic plant or contracted plant is located outside the United States, the Basic plant shall agree to reimburse DSCC for the actual travel expenses of the trip. The reimbursement for expenses is required in accordance with Department of Defense policy regarding foreign manufacturers. The agreement to pay the expenses of the trip must be in the form of a letter which is to be signed by the President and/or Financial Management official and shall be sent to VQE with the pre-audit information. The actual expenses will be based on the Federal Joint Travel Regulation. If the Basic plant refuses to reimburse DSCC for the travel expenses, they will be excluded from participating in the program.

a. In countries with an International Standardization Agreement (ISA), VQE will work with the appropriate National Qualification Authority (NQA) throughout the certification process. The role of the various NQA's varies but their function is similar to that of VQE.

b. In countries that do not have an ISA, all correspondence shall take place directly with VQE.

2.1.6 Facility Certification Audit

DSCC shall supply the plant a basic audit schedule and attendee list a minimum of 5 working days prior to the audit. During the audit, the plant is required to have sufficient personnel available to accommodate the audit team(s). In addition, the personnel involved in the actual manufacture of the product to be qualified shall be available and able to demonstrate and explain their role in the manufacturing process.

Upon the completion of the audit (at the final exit briefing), a written report listing all discrepancies found will be given to the plant. The plant is responsible for performing corrective actions and submitting evidence of the corrective actions to VQE within the specified time frame. A response is expected within 30 days and may include milestones for items that cannot be closed out within the initial 30 days.

It is important to remember that the audit is a sample of the manufacturer's quality system. All corrective actions taken are required to be taken on a system level and it is not acceptable to merely correct the specific discrepancy found during the audit.

2.1.7 VQE Approval

At the time of approval of the plant's corrective actions, VQE will issue facility certification of the basic plant and/or contracted plant for the product line(s) audited. VQE will also issue a laboratory suitability letter for all of the MIL-STD-750 test methods that the facility has demonstrated capability to perform. The certification and laboratory suitability will be reissued following each successful re-audit.

2.1.8 Suspension of Certifications

A facility certification and/or laboratory suitability may be suspended or removed by VQE prior to their expiration but they will not be suspended or removed without written notification. Reasons for suspension or removal include, but are not limited to: noncompliance to MIL-PRF-19500 requirements, quality problems, failure to qualify a device from a certified line within two years of certification, failure to manufacture a qualified device for three consecutive years, failure to allow an VQE audit team access to a facility or documentation, or in the case of foreign facilities, VQE personnel not being allowed to travel to the facility. Loss of certification for any certified line will result in the removal from the QML for all applicable devices.

2.2 On-going Requirements for Existing Certified Facilities

2.2.1 Retention of Qualification

VQE is responsible for validating qualifications on an annual basis and the retention report is the vehicle used to perform the validation. Each basic plant is responsible for submitting a retention report to VQE on an annual basis to maintain their listings on QML-19500. The retention report, when signed by the management representative of the basic plant, is a certification that all product was manufactured in accordance with the design and construction for which qualification approval is currently in effect and to the current revision of the applicable associated specification (slash sheet) at the time of production.

2.2.2 Reporting Period

The basic plant is required to submit the retention report to VQE within 60 days of the end of the reporting period or VQE may remove all of the basic plant's qualification listings. DSCC Form 617 (Summary of Conformance Inspection Test Results) or equivalent as approved by VQE, is to be used for reporting the retention of qualification information. In addition, the following guidelines shall be followed:

a. Lots shall only be reported once (by lot date code) and are to be reported during the reporting period when CI is completed.

b. Resubmitted lots shall be clearly identified.

c. Rejected lots and lots that are withdrawn from JAN consideration are required to be reported.

2.2.3 Additional Retention Report Requirements

The following is the information required to be submitted in/with each retention report:

a. Structural groupings shall be identified.

b. The status of all qualified devices shall be reported. If there was no production during the reporting period, the manufacturer is required to certify that the company still has the capability and facilities necessary to manufacture the item.

c. The Group E status for all qualified devices also shall be identified. This requires the manufacturer to identify the device type(s) tested to Group E, the slash sheet and revision in effect at the time of Group E testing, and the devices (slash sheets) covered by the Group E testing.

d. Inspection lots from slash sheets utilizing the signal transistor (streamlined) flow shall list the wafer lot number and the device type used to perform Group B.

e. For JANS production, screening summaries shall be submitted, including the serial numbers of failed devices, the test parameter and screening step that each device failed, and PDA calculations. Copies of all failure evaluations as required by 19500 paragraph E.5.5 shall also be submitted.

2.2.4 Change in Company Name

When a company name is changed, a letter must be sent to DSCC-VQE specifying the applicable QPL listings to be changed. The following information is required:

a. Old Name

b. New Name

c. Statements regarding changes in:

- Production Machinery
- Production Test Equipment
- Manufacturing Operations, Processes, and Locations
- Quality Control Personnel
- Technical Personnel and Key Supervisors
- Test Laboratory location and facilities
- Cage code

2.2.5 Change in Company Ownership

When a company is sold, a letter from the selling company, to DSCC-VQE, with the following information is required:

a. Name of company purchasing the plant

b. Effective date of transfer of ownership

c. A list of qualified products involved

d. Disposition of qualified products in inventory

- Finished goods (part number, lot date code, and quantity)
- In-process (by lot number, part number, and quantity)
- Complete traceability for all inventory throughout wafer fabrication, assembly, and test (i.e. travelers, log books, and C of C's)

e. Statement of what the sale covers (e.g., all plant equipment, plant site, building, manufacturing and process specifications, patent rights, quality system, etc.)

A letter to VQE from the company purchasing the plant is also required. It must contain:

a. Effective date the company will take control of the plant

b. List of the qualified products that the purchasing company desires for transfer of qualification

c. Any change that will be made in plant personnel, equipment, procedures, processes, quality control, etc.

d. An agreement to furnish DSCC-VQE an estimated schedule of first lot production for each qualified product transferred

e. An agreement to furnish DSCC-VQE a copy of the first lot conformance inspection data for each qualified item, produced under the new ownership, within 30 days after completion of testing

f. Cage code

Dependent upon the circumstances of the purchase, DSCC-VQE may require additional information or require partial or complete requalification.

If the plant manufacturing facilities are to be moved after purchase, section 2.2.8 of this document will apply.

2.2.6 Extension of Qualification to Another Plant

SD-6 provides for extension of qualification to the same product by other plants of the manufacturer when it has been determined by the qualifying activity that the product will be at least equal in all respects to the qualified product. This determination can be made by one of the following:

a. Complete qualification testing in accordance with MIL-PRF-19500.

b. Inspection by DSCC-VQE personnel of the production and testing equipment and quality control and processing procedures for the two plants. Under this option, a review is made of the company's quality manuals, processing and material specifications, as well as a physical audit of the equipment of the two plants. DSCC-VQE will inform the manufacturer of the specific information required. Based on a review of this information and physical audit of the plants, DSCC-VQE will evaluate the adequacy of the manufacturers' proposed testing plan.

2.2.7 Changes to Design and Construction

A design and construction change is a permanent change in design, material, construction, or processing of a product after qualification has been granted. However, it does not include processing adjustments or variations that are necessary during production to hold a product's performance level. If any internal documentation (i.e., design drawing, processing specifications, material specifications, etc.) is to be changed which will affect the information on the Form 36D the manufacturer must receive DSCC-VQE approval prior to shipping any product incorporating the major change. If there is a question, please contact DSCC-VQE for assistance.

2.2.8 Plant Moves and Extension of Qualifications

A qualified manufacturer planning to move a plant from one location to another must notify DSCC-VQE at least 60 days prior to closing down production at the listed plant location. This will provide the opportunity for DSCC-VQE personnel to observe the production operation before shutdown. Failure to provide sufficient advance notice and precluding the opportunity to observe production prior to shutdown may result in removal from the QML and require complete requalification of the products manufactured at the new plant location.

The following information is to be furnished with the notification concerning the plant move. Each item's status is to be identified as being definite or tentative.

a. The address of the new plant location

b. A list of the qualified products for which transfer of qualification is requested

c. A list of the qualified products which will continue to be manufactured at the present plant location

d. A list of the products for which qualification removal will be requested

e. The date when the plant location listed on the QML will discontinue complete or partial operation

f. Changes to be made, if any, in:

- Production equipment
- Production test equipment
- Qualification or Conformance Inspection equipment
- Manufacturing operations and processes
- Quality control and inspection procedures
- Key personnel (including production supervisors, engineers, quality control personnel, test operators, management, and production)

NOTE: Production of the qualified products requires skilled labor; therefore, production line workers are considered key personnel.

2.2.9 Discontinuance of Manufacture of a Qualified Product

When a manufacturer has decided to discontinue producing a product listed on the QPL, they are required to notify DSCC-VQE immediately. Qualification of products for listing on the QML involves a commitment on the part of the manufacturer to provide an end of life offering of at least six months for customers to place orders. Production and delivery schedules will be required to extend beyond the six month order placement period.

3.0 DEVICE QUALIFICATION

3.1 Pre-Qualification Requirements

The Basic plant may, at their option, notify DSCC-VQE in advance of its' intent to qualify a particular product type. It is in the basic plants' best interest to keep VQE informed of their qualification plans. It is strongly recommended that any unique

qualification situations be reviewed with VQE prior to the beginning of qualification testing to help prevent the use of inappropriate or inadequate qualification test plans.

It is the responsibility of the basic plant to insure that the facility or facilities to be used in the manufacturing of devices to be qualified is (are) certified for the applicable technology and quality level prior to the start of the qualification process. This includes both the wafer fabrication and assembly facilities. Devices manufactured at an uncertified facility cannot be qualified and will be cause for rejection of the test report.

3.2 Assurance of MIL-STD-750 Laboratory Suitability

The Basic plant is responsible to insure that all required testing is performed at a facility or facilities with MIL-STD-750 laboratory suitability for the applicable test method(s). Any testing performed at a laboratory without MIL-STD-750 laboratory suitability for the required test method(s) will not be accepted and will be cause for rejection of the test report. DSCC-VQ publishes a "List of Commercial Laboratories Suitable for Testing Military Devices." The laboratories with MIL-STD-750 commercial laboratory suitability can be found in Section II. A copy of the List may be obtained from VQE or the List may be found at DSCC-VQ's web site.

If a manufacturer would like to have testing performed at a commercial laboratory that is not listed, the manufacturer must sponsor the laboratory by sending a letter to VQE requesting the laboratory be audited and specifying what test methods will be performed at the laboratory. Once a laboratory is sponsored they will be sent a pre-audit letter and scheduled for an audit accordingly. The pre-audit and audit requirements will be based upon section 2.1, herein.

3.3 Sampling Methods for Qualification

Small lot sampling shall not be used for qualification inspection. This requirement is stated in 19500 paragraph E.4.1.

3.4 Test Reports

3.4.1 Submittal Requirements

The following shall be submitted to VQE with each test report:

a. A cover letter including the basic plant name, any applicable contracted plant name(s), device type tested, device types to be qualified, quality levels requested, associated specification(s), additional plant location(s), ESDS classification (with data), and the signature of the management representative.

b. One marked test sample for each Group A, B, C, D, and E subgroup (as applicable).

c. A completed DSCC Form 36D, or equivalent as approved by VQE, including the required drawings or photographs. The date and revision block apply to each individual 36D and shall be updated in accordance with the basic plant's document control system. The test report number will be assigned by VQE upon receipt of the test report. The test report reference listed on the QPL normally refers to the report that contains Group C life test and Group E data. The block used for listing the device type(s) covered by the 36D shall include all applicable quality levels.

3.4.2 Report Organization and Structure

Each test report shall be organized in the following fashion:

a. Test reports shall be securely fastened in a durable report folder.

b. All test data shall be listed in the order of the specification test tables and shall include the MIL-STD-750 test method number and/or symbol. If the data is not in the proper order the basic plant must include a key, which clearly identifies the order, and test method number in accordance with the test tables.

c. Each page shall be numbered for reference purposes.

3.4.3 Report Content

Each test report shall include the following information:

a. Group A, Subgroup 1 results shall include the complete and actual text of the required marking and the attribute results of the examinations for marking, workmanship, materials, and design and construction.

b. In-plant and commercial test lab data for electrical, mechanical, conditioning, and life tests shall be the original (not transcribed) data. The data shall include actual test dates, times, temperatures, all electrical conditions, and initials of the person(s) performing the test.

c. Annotated copies of moisture resistance charts and shock pulse photograph with properly labeled axes and appropriate scales.

d. Copies of all original and completed production travelers (wafer fabrication, assembly, conditioning, screening (if applicable), and conformance inspection). This requirement applies to all basic plant and subcontractor travelers. It is not acceptable to use an engineering lot for qualification purposes.

e. For JANS, a copy of the wafer lot inspection report shall be submitted.

f. For decap internal visual, photographs in accordance with MIL-STD-750 Test Method 2075 paragraph 3.1 as required by the Group B table in the applicable associated specification.

Test reports submitted which are not complete and organized as described above may be rejected or may have evaluation delayed pending corrective actions and/or additional material.

3.4.4 VQE Approval

When VQE approves the test report, the Basic plant will be sent written notification of qualification, which will specifically state which devices are qualified. At the time of approval, the basic plant's listing(s) will be added to the QML. If the test report is rejected the basic plant will be sent a failure of qualification letter which will identify the deficiencies of the test report.